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Comparison of the Effectiveness of Diabetes Millitus Exercises and Bast Walking on Reducing Blood Sugar Levels in Type II Diabetes Millitus Patients

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ABSTRACT

Diabetes mellitus is a disorder of carbohydrate, protein and fat metabolism resulting from an imbalance between insulin availability and insulin requirements. This disorder can take the form of absolute insulin deficiency. The research aims to compare the effectiveness of DM exercises and brisk walking in reducing blood sugar levels while in patients with type II diabetes mellitus. This research design is pre-experimental with a two-group pre-post method. The population in this study who suffered from Diabetes Mellitus was 82 cases and the sample selected was 32 sufferers using random sampling. After carrying out diabetes exercise activities, it has an effect on reducing blood sugar levels. The results of the patient sample t-test are obtained (p= (0.000). Diabetes and brisk walking have differences in effectiveness and based on the average difference in reducing blood sugar levels, exercise for diabetes mellitus is 7.44 mg/dl, smaller than brisk walking at 16.56 mg/dl. From this study, brisk walking is more effective in lowering blood sugar levels than exercise miabetus militis. The implication of this research is that brisk walking is effective in lowering blood sugar levels if done regularly and diabetes exercise can be an alternative for lowering blood sugar levels.

Keywords: Brisk Walking, DM Exercise, Healthy Lifestyle

BACKGROUND

People's behavior has changed as a result of the increasingly developed world. A large number of people now consume unhealthy food, rarely engage in physical activity or sports, stay up late at night, and engage in other harmful behaviors. (Afriza, 2015) Diabetes (DM) is a condition of the metabolism of fat, protein, and carbohydrates that is brought on by an imbalance between the amount of insulin required and its availability. Damayanti, the year 2015.

In 2021, there will be 10 million DM patients in Indonesia. This data indicates that 17.9 million people are in high danger. In Indonesia, the province with the highest number of DM cases is East Java. The population of East Java Province is 1,869,300. Data acquired indicates that 3,787 people in Kediri Regency suffer from diabetes. Results for 677 patients with diabetes mellitus who had treatment between January and December 2021 were collected. Numerous factors, including genetics, an unhealthy lifestyle, obesity, and a lack of physical activity, can lead to type II diabetes mellitus. Common complaints of type II diabetes mellitus symptoms include exhaustion, losing weight while eating a lot.

One of the most important ways to prevent complications from Type II diabetes mellitus is for those who have the disease to engage in regular physical exercise. This can help control blood sugar levels, reduce body weight, enhance respiratory and cardiovascular health, raise

HDL and lower LDL cholesterol, and prevent coronary heart disease when done correctly (Perkemi, 2012). Theoretically, exercise can regulate blood sugar. During exercise, glucose is transformed into energy. Engaging in physical activity can raise insulin levels, which in turn lower blood sugar levels. The researcher wishes to compare the efficacy of DM and other treatments in light of the issues and phenomena that were previously discussed.

METHODS

Pre-experimental in nature, this study used a two-group pre-post methodology. Two groups are involved in the cause and effect research design, according to Sugiono (2017). The comparative efficacy of diabetes mellitus exercise and brisk walking in lowering blood sugar levels was investigated using this design. There was no control group used in this study. Using two groups of people with diabetes mellitus and two different interventions brisk walking and diabetes-specific exercises this research design demonstrated cause and effect.

RESULTS

Respondent Characteristics

Characteristics of Respondents in Selosari Village on 09 October 2022

Characteristics	**Fast Walking Group**		**DM Gymnastics Group**	
Age	**f**	**%**	**f**	**%**
45-50 Years	7	43.8	8	50.0
51-55 Years	9	56.3	8	50.0
Total	**16**	**100%**	**16**	**100%**
Weight	**f**	**%**	**f**	**%**
40-50	3	18.8	1	6.3
51-60	8	50.0	9	56.3
61-70	4	25.0	5	31.3
71-80	1	6.3	1	6.3
Total	**16**	**100%**	**16**	**100%**
Gender	**f**	**%**	**f**	**%**
Man	2	12.5	1	6.3
Woman	14	87.5	15	93.8
Total	16	100%	16	100%
Diet Status	**f**	%	F	%
Diet	**16**	100	**16**	**100**
Work	**f**	%	**F**	**%**
Farm workers	**6**	37,5	**5**	31,3%
Housewife	**8**	50.0%	**10**	62,5%
Teacher	**1**	6,3%	**1**	6,3%
Farmer	**1**	6,3%		
Total	**16**	100%	**100**	100%
Take medication	**f**	%	**f**	%
No medication	**7**	43.8%	**10**	62.5%
Gemlipyrid	**3**	18.8%	**4**	25.0%
Metformin	**6**	37.5%	**2**	12.5%
Total	**16**	100%	**16**	100%

Source: Primary Data 2022

Frequency Distribution of Lowering Blood Sugar Levels Before DM Exercises

Knowledge	Frequency	Presentation (%)
Nomal		
Hyperglycemia	16	100
Total	**16**	**100**

Source: Primary Data 2022

Frequency Distribution of Lowering Blood Sugar Levels After DM Exercises

Knowledge	Frequency	Presentation (%)
Normal		
Hyperglycemia	16	100
Total	**16**	**100**

Source: Primary Data 2022

Frequency distribution of lowering blood sugar levels before taking a brisk walk

Knowledge	Frequency	Presentation (%)
Normal		
Hyperglycemia	16	100
Total	**16**	**100**

Source: Primary Data 2022

Frequency Distribution of Decrease in Blood Sugar Levels After Fast Walking

Knowledge	Frequency	Presentation (%)
Normal	1	6.3
Hyperglycemia	15	93.8
Total	**16**	**100**

Source: Primary Data 2022

Research Results Data

The Effect of Brisk Walking and DM Exercises on Reducing Blood Sugar Levels

Group	Df	Mean	Standard Deviation	Standard Error Mean	T	ρ-value
Fast Walk	15	16.563	4.531	1.133	14.622	0.000
DM exercise	15	7.438	6.000	1.500	4.959	0.000

Source: Primary Data 2022

Effectiveness Effectiveness of brisk walking and DM exercise in reducing blood sugar levels

Group	Df	Mean/ Delta	Standard Deviation	Standard Error Mean	T	ρ-value
Fast Walk	30	16.56	4.531	1.880	4.855	.000
DM exercise	27.910	7.44	6.000	1.880	4.855	.000

DISCUSSION

The Effect of DM Exercise on Reducing Blood Sugar Levels

According to these statistics, there were 8 respondents (50.0%) in the DM exercise group for people aged 40–50 and 8 respondents (50.0%) for those aged 51–55. One respondent (6.3%) weighed 40–50 kg and walked briskly, nine respondents (56.3%) weighed 51–60 kg, four

respondents (25.0%) weighed 61–70 kg, and one respondent (6.3%) weighed 71–80 kg. 6.3%. In the DM gymnastics group, there were two male respondents (12.5%) and fourteen female respondents (87.5%). Five respondents (31.3), ten respondents (31.3), ten respondents (62.5), and one teacher made up the DM gymnastics respondents' occupation. (6.3). Two Metformin (12.5%), four Gemplipirid (25.5%), and ten respondents (62.5%) did not use any medicine.

Patients with diabetes mellitus who participated in the DM exercise group saw an average drop in blood sugar levels of 7.438 before and after brisk walking, with an average standard deviation of 6.000 and a mean standard error value of 1.133. These findings indicate that the comparison value is $\alpha = 0.05$ and the significance value, or P-Value, is 0.000. The hypothesis is accepted since the P-Value value is less than 0.05, indicating that DM exercise has an impact on lowering blood sugar levels.

This study is consistent with Damayanti's (2015) findings. Insulin is unable to assist in the transport of glucose into cells as a result of this disturbance. Insulin resistance falls with physical activity because contracting muscles have increased membrane permeability.

According to Boule et al. (2001), the results of a later meta-analysis demonstrated that intense physical activity is more effective than non-intensive physical exercise at predicting the mean difference in HbA1C ($r = 0.91$, $p = 0.002$) ($r = 0.46$, $p = .26$). This demonstrates how regular exercise conducted at the appropriate intensity might enhance the lowering of blood sugar levels in people with diabetes mellitus. Because more blood glucose is being delivered into the tissues when DM activities are performed, the blood's glucose content will drop. Researchers have found that a number of factors, including activity, nutrition, and medicine digestion, affect the drop in blood sugar levels.

The Effect of Brisk Walking on Reducing Blood Sugar Levels

Seven respondents (43.8%) were between the ages of 40 and 50, while nine respondents (56.3%) were between the ages of 51 and 55, according to data from the Fast Walking group. Three (18.8%) of the respondents who were brisk walking weighed between 40 and 45 kg, whereas eight (50.0%) and four (25%), respectively, were between the ages of 51 and 60 and 61 and 70. One respondent (6.3%) was aged 71–80. There were two male respondents (12.5%) and fourteen female respondents (87.5%) in the brisk walking group. Six respondents (37.5), eight respondents (50.0), one respondent (6.3), and one respondent (6.3) were fast walkers, and their occupations included farms. Seven respondents (43.8%), three respondents (18.8%), and six respondents (37.5%) did not take any medication. Considering these.

This study supports that of Listyarini and Fadilah (2017), who found that brisk walking lowers blood glucose levels in people with diabetes mellitus in Klumpit village, Gebog subdistrict, Kudus district. Nurhayati, Angkasa, and Isrofah Research (2015). demonstrates that, with a p value of $0.180 \tilde{}\ 0.05$, walking for 30 minutes has no discernible impact on blood sugar levels in individuals with type II diabetes mellitus in Krangsari village, Karanganyar subdistrict, Pekalongan district.

This demonstrates how regular, appropriate brisk walking can lower blood sugar levels. If brisk walking is done consistently for at least half an hour, it can be considered exercise. Fast walking, according to researchers, does more than only move the lower extremities.

Effectiveness Between Brisk Walking and DM Exercises on Reducing Blood Sugar Levels

Based on the results of the effectiveness test, the mean value of brisk walking (30) and DM exercise (27,910), the delta score increase is greater for brisk walking than for DM exercise, meaning it can be concluded that brisk walking is more effective in reducing blood sugar levels than DM exercise. The p-value = 0.000 with a significance comparison level = 0.05.

This shows that p<0.05 significance level (0.000<0.05) means that there is effectiveness of brisk walking and DM exercise in reducing blood sugar levels in Selosari village.
This research is in line with research by Rahmanita Mudatsir and Teuku Tahlil (2017). This research explains that there is a difference between blood glucose levels (KGD) before and after diabetes exercise (p value 0.002) where the KGD can improve fat profile, reduce weight and maintain fitness.
According to the findings of Agus Sutiono and Dedy Purwito (2020), of the 82 participants, 41 engaged in pronalis exercise and 41 engaged in walking prior to the intervention, 70% of their blood sugar levels fell between 250 and 280, and following the intervention, blood sugar levels decreased for the majority of participants (75%; 36). According to the Wilcoxon signed rank test statistical test, walking and exercise have a significant impact on lowering blood glucose levels in people with type II diabetes, as seen by the results of 1 (a-count) = 0.000 and correlation Z = 7.866.
Brisk walking is a physical activity that uses muscles, particularly leg muscles, to travel from one place to another (Gumilar, 2016).

CONCLUSION

The research concludes that brisk walking is more effective than diabetes mellitus (DM) exercise in reducing blood sugar levels, as shown by the mean decrease in brisk walking (30 mg/dl) compared to DM exercise (27.910 mg/dl) with a significant p-value of 0.000. DM sufferers are encouraged to engage in brisk walking and regularly monitor their blood sugar levels. Health centers should educate DM patients on the benefits of physical activity, while nurses can offer guidance on both DM exercises and brisk walking. Future researchers are advised to expand on these findings using current theories.

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